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IMMEDIATE POLLUTION CONTROL NEEDS, OREGON COAST

Federal Water Pollution Control Administration
Portland, Oregon

February 1967

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OREGON COAST BASIN

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1967

IMMEDIATE POLLUTION CONTROL NEEDS

OREGON COAST

U. S. Department of the Interior
Federal Water Pollution Control Administration
Northwest Region
Portland, Oregon

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I. Introduction

The purpose of the report, "Immediate Pollution Control Needs--Oregon Coast," is to focus attention on known sources of pollution which affect the water use or aesthetic environment and to recommend priorities for action to abate that pollution. The recommendations herein are based on evaluations of data obtained from the Oregon State Sanitary Authority and engineering and economic studies conducted by the Columbia River Basin Comprehensive Project. Authority for these studies is the Federal Water Pollution Control Act, as amended (33 U.S.C. 466 et seq.).

Most of Oregon's coastal waters have the pristine quality characteristic of the excellent fishing, recreational, and aesthetic uses they support; this quality must be protected. In a few isolated areas, water quality problems have periodically or consistently damaged water use. And in other areas, potential pollution threatens to retard use in the immediate future. This report is directed toward the immediate correction or prevention of these existing or potential pollution situations.

Priorities listed are based solely on an evaluation of the coastal region and not on a relative ranking in the total Columbia River Basin.

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II. Summary of Immediate Pollution Control Needs (priority indicated by number in parentheses and area shown by alphabet letter)

Waste Treatment

Area	Responsibility	Need	Priority
A	City of Wheeler	primary treatment and chlorination	(1)
	City of Nehalem	primary treatment and chlorination	(1)
B	City of Tillamook	continuous and effective chlorination	(1)
		expansion of existing secondary plant	(2)
	Tillamook County Creamery Assn. cheese plant	separation and treatment of domestic wastes	(1)
		continuous operation of whey drying facilities	(2)
	Naval Air Station complex	secondary treatment and chlorination	(1)
C	Lincoln City	expansion of secondary treatment plant	(2)
D	City of Toledo	chlorination and elimination of bypasses	(1)
		expansion of existing primary plant	(2)
	Georgia-Pacific Corp.	suspended solids removal from paper machine wash	(1)
E	City of Reedsport	primary treatment and chlorination	(1)
F	Coos Head Timber Co. pulp mill	suspended solids removal and chemical recovery	(1)
G	City of Bandon	primary treatment and chlorination	(1)

Flow Regulation

H - South Umpqua River - storage to provide minimum flow of 190 cfs for quality control. (2)

I - Bear Creek - storage to provide minimum flow of 75 cfs for quality control. (2)

Other Pollution Control Practices

D & F - Improved control of log storage and dumping areas in Coos and Yaquina Bays. (2)

Elimination, by export, storage, or treatment, of the following glue wastes presently discharged without treatment (see "Research"): (1)

J - U. S. Plywood - Siuslaw River

E - International Paper - Winchester Bay

F - Menasha Corporation - Coos Bay

Weyerhaeuser Company - Coos Bay

Coos Head Timber Company - Coos Bay

G - Georgia-Pacific Corporation - Coquille River

Improved land management practices by lumbering operations and road builders in the Wilson, Nehalem, Rogue, and Umpqua and Coquille watersheds. (1)

Control of placer mining in the Rogue and Umpqua River Basins. (2)

Institutional Practices

- The State of Oregon should proceed to adopt water quality standards, as required by the Federal Water Pollution Control Act, for Oregon coastal streams. In addition, standards for intrastate streams in the basin should be adopted along similar lines. These standards should clearly recognize the coastal region's function as a producer of anadromous fish and shellfish and as a recreational playground. (1)

- The State of Oregon should consider legislation to provide appropriations for State participation in grants for construction of sewage treatment works. (2)

- The State of Oregon should exercise control to ensure that flows released from storage for water quality control are not appropriated for other uses. (2)

- The Bear Creek Valley Sanitary District should adopt plans for, and implement, an area system of sewage collection and treatment. (2)

- The State of Oregon should provide an expanded staff for the Oregon State Sanitary Authority so problems can be inventoried, corrective actions promoted, and measures followed up until problems are corrected. (1)

Research

- Research by the plywood industry and the Federal Water Pollution Control Administration to determine effective and economical means of treating glue wastes. (1)

- Study by the lumber industry of alternate methods of log storage. (2)

III. Problem Areas and Immediate Needs

Extremely high water quality is required by the uses that characterize the waters of the Oregon coastal system. Production of salmonid fish, shellfish propagation, and recreational and aesthetic opportunities are curtailed, made more costly, or eliminated entirely where pollution exists in these areas. The following actions, enumerated by problem area, are necessary to protect the use and quality of Oregon coastal waters:

Tillamook Bay

Of highest priority is the need for treatment and chlorination of sanitary wastes presently discharged near the mouths of the Wilson and Trask Rivers and directly to the bay. The bacterial quality of sections of Tillamook Bay, especially during periods of high runoff, exceeds recommended bacterial levels for shellfish growing. The shellfish beds currently have provisional approval for interstate shipment of oysters. The higher coliform levels result primarily from the overloading and bypassing of the City of Tillamook's municipal treatment plant, the discharge of untreated domestic sewage from the Tillamook Naval Air Station and the Tillamook cheese plant, and an unquantified contribution of non-human coliform organisms associated with runoff from pastureland.

Continuous and effective chlorination of the effluent of the Tillamook sewage treatment plant should be achieved before 1968, and expansion of these secondary facilities will be required in the next five years. Domestic and industrial wastes from the Tillamook cheese plant should be separated and the domestic wastes treated. Whey drying

facilities should be operated continuously to prevent bacterial growth nutrients from reaching the harbor. The Tillamook Naval Air Station complex, which includes the Federal Job Corps Center, should provide secondary treatment for its wastes; the Port of Tillamook Bay and the Federal Government are the agencies responsible for providing such facilities.

Coos Bay

Treatment of Coos Head pulp mill wastes, elimination of glue waste discharges to the bay, and a better control of log dumping and storage are needed to improve the aesthetic and recreational opportunities of the Coos Bay area and remove deterrents to fish and shellfish propagation. Sulfite waste liquor and fiber from the Coos Head pulp mill and accumulations of debris and leached wood sugars from log storage contribute to an oxygen demand which reduces oxygen levels below fish migration requirements in late summer and early fall, as well as provide unsightly and interfering floating materials on the bay. Three plywood manufacturers--Menasha, Weyerhaeuser, and Coos Head Timber--discharge untreated phenolic resin glue wastes to the bay. These wastes have been shown to be toxic to fish, shellfish, and other aquatic life.

Treatment of the Coos Head mill sulfite wastes and elimination of glue wastes are needs of a first priority; reduction of log dumping and storage is a second priority need. The mill should provide primary treatment--removal of floating and settleable solids--and chemical recovery facilities. Glue wastes should be disposed of by tanking, lagooning, or other feasible means as an interim measure until an

economical method of treatment can be developed. The difficulties in reducing log storage are recognized; however, efforts should be made by lumber industries to reduce debris and provide land storage where feasible.

Other Estuaries

Yaquina Bay - Removal of settleable solids from the Georgia-Pacific Corporation's white water and continuous chlorination of the Toledo sewage treatment plant effluent are needs of a first priority. Other needs include the expansion of the Toledo municipal treatment facilities and better control of log storage areas in the bay.

Like Coos Bay, Yaquina Bay experiences floating debris and settleable solids, as well as oxygen depression during the summer months. These conditions are a deterrent to aquatic life and the recreation potential of the bay. Bacterial contamination from the City of Toledo's treatment facilities has been identified by Federal authorities as a potential threat to interstate shipment of shellfish.

Umpqua and Nehalem Bays - Primary treatment and chlorination of municipal wastes from Reedsport, Nehalem, and Wheeler are needed to protect water-contact recreation and sport fishing (including clam digging and crabbing) from bacterial pollution.

Inland Problem Areas

South Umpqua River

Storage to provide flow regulation to maintain minimum summer flows and to enhance water temperature regimes in the South Umpqua River is a second priority need. Water quality during low flow periods does not

meet either dissolved oxygen or temperature requirements for anadromous fish migration. There is an immediate need for a draft on storage of 16,000 acre-feet to provide a minimum average flow of 190 c's for control of dissolved oxygen in the summer months. A total storage of about 50,000 acre-feet will be needed by 2000. A minimum flow of 1,200 cfs has been recommended by fishery agencies for temperature enhancement. Such a flow would also satisfy other water quality needs.

Bear Creek

Storage to provide a minimum flow of 75 cfs for water quality control on Bear Creek is a second priority need. This small stream which receives the City of Medford's treated municipal wastes becomes an aesthetic nuisance during summer months when flows are low and water is diverted for irrigation. Nutrients from sewage effluents promote extensive aquatic growths. Additional treatment to remove nutrients and expansion of present facilities serving the Medford metropolitan area will be needed in the near future to adequately handle the wastes in the most rapidly growing area in Oregon.

Fishery agencies have recommended storage to provide a minimum flow of 2,000 cfs in the Main Stem Rogue River to control temperature for fishery enhancement. This flow would be in addition to the flows recommended for Bear Creek, which is tributary to the Rogue.

Other Areas

Throughout all the drainage basins of the Oregon Coast, there are many small local problems of water pollution. Although singly they are not of major concern, the compounding effect is significant. In several

of these areas, installation of treatment facilities or expansion of those existing is needed (as noted in the summary table). In other areas, industrial surveys are needed to determine the nature and extent of waste treatment needs. In several metropolitan areas, planning is needed to prevent chaotic and single stage project development and to solve a broad area need.

This list of needs and problems is not considered all-inclusive and does not reflect the ultimate in precision and detail in evaluating alternatives. The actions recommended here are, however, prerequisite to good water quality planning and should be included in local and State programming for water pollution control. Background for these immediate needs is summarized in Section VI.

IV. Cost of Immediate Pollution Abatement

Cost estimates of the waste abatement measures enumerated in this report indicate that about $3 million must be invested in treatment facilities over the next five years. Roughly two-thirds of this amount--an estimated $2 million--will be required by the wood products and paper industries for installation of waste control facilities.

Cost of storage for water quality control flow regulation on the Bear Creek and South Umpqua River is estimated to be $1.2 million.

No estimate of cost is attempted for management procedures, institutional practices, and research needs.

agencies have recommended storage for temperature enhancement in both projects which would fulfill the other quality needs.

VI. Background

A. Pertinent Basin Characteristics

The Oregon Coast Basin drains an area of 17,000 square miles--a ribbon between the Pacific Ocean and the coastal mountains which broadens as it moves south toward the California border. Over 85 percent of the basin is forested and the climate is humid, the result of the temperature-moderating Pacific Ocean and the intensification of rainfall induced by the Coast Range.

Although rainfall varies considerably in magnitude throughout the basin, the seasonal distribution is quite uniform. This and similar vegetative and soil conditions result in a fairly uniform seasonal streamflow pattern. Runoff varies directly with precipitation, with peak flows occurring in December, January, and February. Low flows occur in July, August, September, and October and reflect low precipitation and lack of streamflow regulation on the coast. In general terms, this distribution of runoff is the cause of many water quality anomalies.

High storm runoff has resulted in the overloading of treatment facilities in some communities and caused bypassing of raw sewage to receiving streams; many sewers are of the combined type which carries both sewage and storm water directly to the treatment plant. In other areas, lack of streamflow in the summer precludes acceptable water quality because effective waste assimilation is drastically reduced.

The economic and population base is a significant indicator of water pollution problems (or lack of problems) on the coast. The total population of the area is 309,000, resulting in a population density of 18 persons per square mile as compared with densities of 100 per square mile in the Willamette Basin and 50 per square mile in the United States. Population centers include the Tillamook Bay area (8,000); Newport-Toledo (11,000); Coos Bay-North Bend (33,000); Roseburg (35,000); Grants Pass (21,000); and Medford (59,000). The largest concentrations, except for Coos Bay, are located away from the ocean in the Rogue and Umpqua Basins.

The economy of the coast is a very specialized one. Employment figures show that about 30 percent of the total labor force is involved in lumbering activities, and about 55 percent is employed in the service industries, primarily those oriented towards recreation and tourism. Wood products manufacturing, which comprises 85 percent of the total manufacturing, is the primary waste producer on the coast. Bark, fiber, glue, and sulfite liquors are wastes which affect water use. Although there is some food processing, this is not a significant source of waste.

Water use of the coastal region is a third characteristic which helps define water quality problems in the area. Whereas in many river basins throughout the country recreation receives a relatively low priority compared with other uses, on the Oregon Coast it receives the highest priority. The streams and estuaries of Oregon are the recreational playground not only for residents but also for tourists. Aesthetic beauty, water-contact sports, boating, fishing, clam digging, and crabbing are only a few of the attractions offered.

Just as significant are the spawning and rearing areas for the Pacific Coast salmon and other anadromous species, prized by sport and commercial fishermen alike. Two species in particular, Chinook and Coho salmon, contribute to extensive ocean sport and commercial fisheries from Alaska to California. Cutthroat and steelhead trout support large recreational fisheries in the Oregon bays and their tributary streams. In addition, oysters are harvested commercially in several coastal estuaries.

The above uses are particularly significant because of the high water quality required to support them. Contamination of recreational waters or shellfish growing areas by discharges of untreated or improperly disinfected sewage poses a threat to health. Anadromous fish require extremely high levels of dissolved oxygen and low temperatures to carry on their life cycle. And last, floating debris, color, and turbidity seriously reduce the recreation potential of the area.

B. Present Water Quality Problems

1. Bacterial Contamination of Recreational and Shellfish Growing Areas

In several areas of the Oregon Coast, discharges of untreated or inadequately disinfected sewage have reached the point of causing a threat to health. These areas include Nehalem Bay, Tillamook Bay, Yaquina Bay, and Winchester Bay. The most significant of these areas are Yaquina and Tillamook Bays, where only recently the United States Public Health Service Division of Environmental Engineering and Food Protection has "conditionally approved" oyster growing areas with the

stipulation that action be taken by 1968 to reduce coliform levels in the bays. The sources of bacterial contamination are the Tillamook cheese plant, the City of Tillamook, the Naval Air Station, and pasture runoff. The most pronounced problems occur when storm water runoff overloads the city's plant and runoff from livestock pastureland is highest. However, the Tillamook cheese plant discharges sanitary and industrial wastes directly to the Wilson River, and the Tillamook Naval Air Station discharges untreated domestic wastes to the Trask River--both of which are tributary to the bay. In the case of Yaquina Bay, Toledo's treatment plant is the source of contamination. The State of Oregon has contended that the vast majority of the coliform and fecal coliform population observed in Tillamook Bay during periods of heavy precipitation is not of human fecal origin and has little public health significance. Efforts are currently being made by the State to substantiate this contention.

Bacterial contamination of Nehalem and Winchester Bays must be considered an implied problem. The Cities of Nehalem and Wheeler (combined population of about 500) and the City of Reedsport (population 3,000) discharge untreated sewage to Nehalem and Winchester Bays, respectively. Both bays are heavily used for recreation, fishing, and clam digging and should be protected from such discharges.

2. Damage to the Recreational and Aesthetic Environment and to Fish and Shellfish Production by Wastes from Paper and Plywood Mills and Other Lumbering Activities

Lumbering and wood products manufacture are the principal sources of industrial waste on the Oregon Coast. In two estuaries--

Coos Bay and Yaquina Bay--these wastes are considered to be problems. In both Yaquina and Coos Bays, waste problems are intensified by low flows in the summer months which reduce assimilative capacity and are inadequate to effect net seaward transfer of water through the tidal reaches. The result is movement of accumulated wastes back and forth with the tide instead of the flushing of debris and organic wastes out to the ocean.

Coos Bay is surrounded by a major industrial and domestic community; it is the focus of the largest population and industrial development on the coast. Although the estuary could have considerable value as a recreational area and shellfish producer, industrial pollution and industrial use have allowed the bay to deteriorate into an aesthetic nuisance. Dissolved oxygen levels during the summer and early fall drop to the 1-2 mg/l range; a section of the bay below the Coos Head pulp mill outfall is almost sterile of normal aquatic populations; glue wastes--shown by research to be toxic to aquatic life--are discharged untreated to the bay; and debris and floating material cover a large portion of the water surface.

Solutions of this area's problems are difficult. Flow regulation--which would improve conditions considerably--is not a feasible alternative because reservoir sites are not available. The only solution is to remove wastes from the bay through treatment, export, or recovery and good housekeeping. In particular, glue wastes from plywood plants and the wastes from Coos Head pulp mill must be removed. Suspended solids removal and chemical recovery by the pulp

mill, and export or land disposal of glue wastes until an economical treatment procedure can be determined are necessary actions to improve water quality conditions.

The practice of dumping and storing logs in the bay is a use very damaging to recreation. Truck transport and cold-decking are alternatives to be considered where feasible. Better housekeeping procedures where logs must be boomed would cut down on floating debris.

Yaquina Bay experiences problems similar to those of Coos Bay but to a lesser degree. Although there are no glue wastes discharged and the majority of Georgia-Pacific's pulp mill waste is pumped to the ocean, untreated wash water from paper machines which is high in fiber content and low in oxygen demand is discharged to the bay. This, together with log dumping debris, causes oxygen reduction and nuisance conditions which hinder recreation and fish migration.

3. Interference with Anadromous Fish Activities Caused by Low Dissolved Oxygen and High Temperature Conditions in Inland Streams

In several reaches of the Rogue and Umpqua Basins, water quality during low flow periods does not meet dissolved oxygen or temperature requirements for anadromous fish activities. The primary cause is lack of water to assimilate wastes and retard natural heating of the stream. Wastes in both basins receive a high degree of treatment (about 85 percent reduction of oxygen demand). Storage to provide flow regulation for quality control in the South Umpqua* and Bear Creek** has

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* Tiller and Galesville Projects, Umpqua River Basin, U. S. Department of the Interior, Federal Water Pollution Control Administration, 1966.

** Rogue River Basin, Medford Division, U. S. Department of the Interior, Federal Water Pollution Control Administration, 1965.

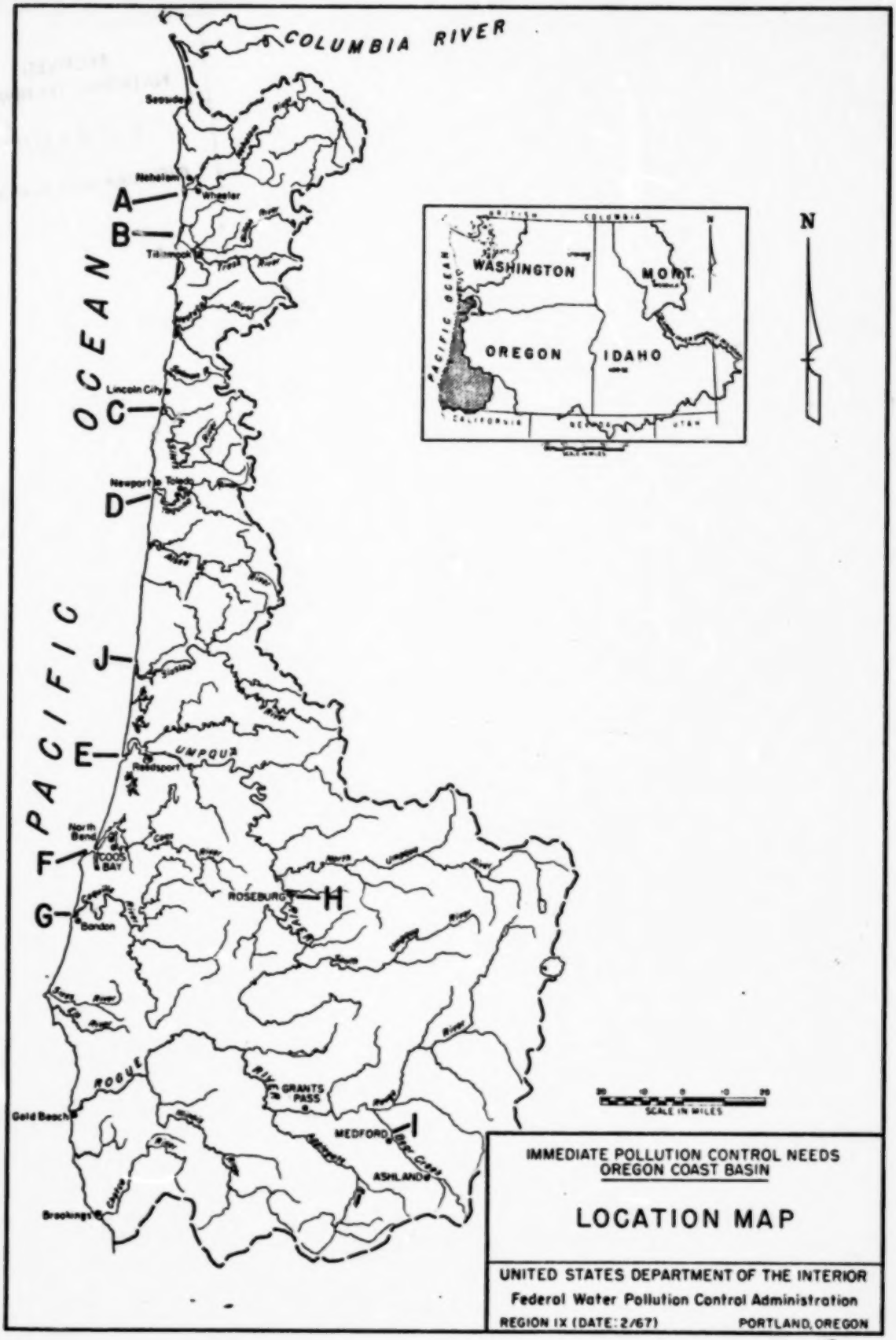
been recommended for inclusion in the Tiller and Lost Creek Reservoirs proposed by the Corps of Engineers. Such flow regulation would raise dissolved oxygen levels and lower temperatures during the critical period.

4. Turbidity Interference with Fish Production, Wildlife, and Recreation

The Oregon coastal streams experience high sediment loads during heavy rainfall and placer mining activity. Such turbidity interferes with fish production, wildlife, and recreation.

The forests of the coast are characterized by extremely steep-sided ridges and V-shaped canyons. Heavy rainfall and marine sedimentary rock formation bring about a high rate of erosion. The stability of the watersheds depends on vegetative cover and the ability of the soil to absorb water. The water resource is therefore easily affected by land management.

Approved practices for road building, logging, and placer mining, as well as restoration of soil stability where forest fires or other land clearing has occurred, are essential to reduce sediment production and to maintain good water quality.



IMMEDIATE POLLUTION CONTROL NEEDS
OREGON COAST BASIN

LOCATION MAP

UNITED STATES DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
REGION IX (DATE: 2/67) PORTLAND, OREGON